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West Europe Report

SCIENCE AND TECHNOLOGY

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WEST EUROPE REPORT
SCIENCE AND TECHNOLOGY

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AEROSPACE

FRANCE ANNOUNCES 1984 BUDGET FOR SPACE ACTIVITIES, CNES

Paris AFP SCIENCES in French 22 Mar 84 pp 14-17

[Text] Paris 21 Mar (AFP)--France, this year, will be devoting 4,763.305 MF [million francs] to space activities, up 33.8 percent over 1983, according to a consolidated CNES [National Center for Space Studies] document detailing its budget and its programs for 1984.

Most of this money will be in the form of subsidies from the Ministry of Industry and Research (3,627.330 MF). The rest (481.5 MF) will be provided from budgetary credits allocated to other ministries, the Defense Ministry providing the largest share (266.8 MF), PTT providing the next largest (188.2 MF), and so forth, and from the organization's own funds (782.555 MF).

French participation in the different programs of the ESA [European Space Agency] will be taking the lion's share of the CNES's budget, namely, 1,901.2 MF, or close to 1 GF [billion francs] more than the amount budgeted for the national space program in the narrow sense of the term (984.13 MF), and exceeding by even more the amounts allocated to the various bilateral cooperative programs (540.45 MF).

A total of 696.475 MF out of the overall budget will go to cover the general operating expenses of the organization.

The Ariane rocket program, which is being pursued within the framework of the ESA has been allocated a total of 838.4 MF, of which 115.3 MF are earmarked for the development of the European rocket, 291.4 MF for the production of these satellite launchers, and 120 MF for the industrialization program.

Included in the 1984 budget are 70.6 MF for development of the Ariane 2 and 3 launchers, which are more powerful than the model that has already been used eight times (Ariane 1), and 241.4 MF for Ariane 4, which, with its six different versions, will be able to lift satellites weighing from 2,000 to 4,300 kg into geostationary transfer orbit.

The rest of the credits allocated to European cooperation are divided among scientific programs (ultraviolet-ray studies, X-ray studies, participation

in the space telescope, in the Giotto program of studies of Halley's comet in 1986, etc), telecommunications programs (ECS, Marecs satellites), earth-observation programs (Meteosat, ERS-1 satellites), space vehicles (Spacelab laboratory), development of the new HM-60 engine for the future European launcher, continued work on the construction of the second launching platform at the Guyanese Kourou Space Center, etc...

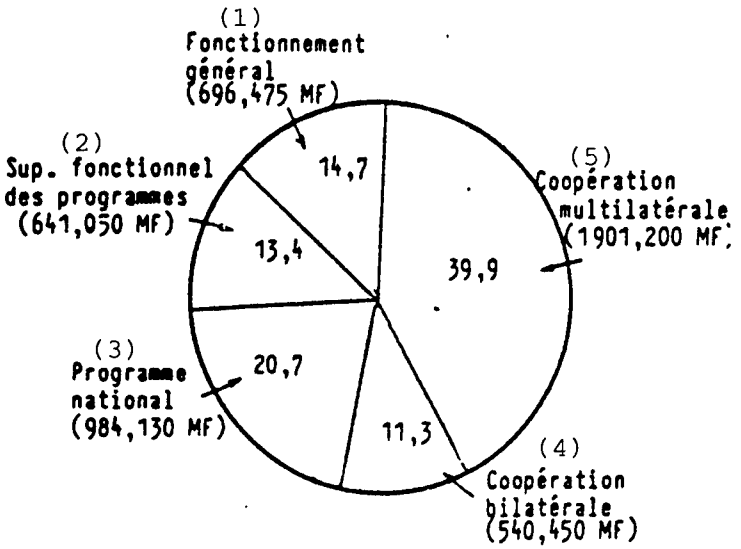
It is to cooperation with the RFA that the largest sums are being allocated this year, totaling 361.5 MF, essentially all (358.4 MF) earmarked for telecommunications programs (TDF-1 and TV-SAT satellites).

Franco-American cooperation has made a considerable forward stride, with an allocation of 83.2 MF, of which 10 MF are earmarked for the preparation of manned space flights--with astronautauts, ahead of that with the Soviet Union, to which 50.55 MF have been allotted, only 2.7 MF of which will go into identical preparations.

Earth observation, with the two SPOT satellites, the first of which is to be launched during the first half of 1985, will have the largest share (709.7 MF) of the total budgeted for the national space program, followed by telecommunications (117.33 MF) with its "beacon" programs Telecom-1 and Telecom-2 scheduled for launch during the year (the first one in July), research and development (132.5 MF), studies using balloons (18.2 MF), and strictly scientific programs (6.4 MF).

Many of the latter, it should be noted, are those being pursued under various international cooperative agreements.

1984 CNES Budget (Subsidies and Self-Generated Funds)



(6) 4 763,305 MF

Key:

1. General operating expenses.
2. Operational support of programs.
3. National program.
4. Bilateral cooperation.
5. Multilateral cooperation.
6. [Total] 4,763.305 MF.

Breakdown of Allocated Credits
(State-Provided Subsidies and Self-Generated Funds)*
(In Millions of Francs)

(1) PAR CATEGORIE DE PROGRAMMES D'ACTION	Montant 1984 (2)	% 1984	% 1983	(8) PAR TYPE DE MOYENS	Montant 1984 (2)	% 1984	% 1983
Programme européen (3)	1 901,200	39,91	36,12	Lanceurs (9)	847,900	17,80	14,84
Programmes bilatéraux (4)	540,450	11,35	12,26	Satellites (10)	1 654,930	34,74	37,92
				SPACELAB (11)	90,300	1,90	1,46
Programme national (5)	984,130	20,66	24,32	Ballons (12)	18,200	0,38	0,50
Support fonctionnel technique (6)	641,050	13,46	11,12	Exp. scientifiques (13)	132,500	2,78	2,91
Fonctionnement Général (7)	696,475	14,62	16,18	Exp. et systèmes d'applications (14)	66,100	1,39	1,77
				Recherche & Développ. (15)	132,500	2,78	3,60
				Support fonctionnel des programmes (16)	1 820,875	38,23	37,00
TOTAL	4 763,305	100	100		4 763,305	100	100

(*) Montants hors taxes. (17)

Key:

1. By Program Action Categories.
2. Sum [in year].
3. European program.
4. Bilateral programs.
5. National program.
6. Technical operational support.
7. General operating expenses.
8. By Types of Means Involved.
9. Launchers.
10. Satellites.
11. Spacelab.
12. Balloons.
13. Scientific experiments.
14. Application systems and experiments.
15. Research and development.
16. Operational support of programs.
17. Sums exclusive of taxes.

[Table continues next page]:

[Continuation of table from preceding page]:

Breakdown of Allocated Credits (cont'd)
(State-Provided Subsidies and Self-Generated Funds)*
(In Millions of Francs)

(18) PAR CATEGORIE D'OBJECTIFS

	Montant 1984	% 1984	% 1983
(2) Sciences (19)	425,100	8,92	9,38
(20) Applications, dont :	2 384,830	50,07	49,93
(21) - télécommunications	612,330	12,86	12,66
(22) - Observation de la terre & collecte de données	924,600	19,41	22,43
(23) - Moyens de lancement	847,900	17,80	14,84
(24) Recherche & Développ.	132,500	2,78	3,60
(25) Support fonctionnel des programmes	1 820,875	38,23	37,09
	4 763,305	100	100

Key (cont'd):

18. By Categories of Objectives.
19. Sciences.
20. Applications, comprising: .
21. Telecommunications.
22. Earth observation and collection of data.
23. Launching facilities.
24. Research and development.
25. Operational support of programs.

Allocations to Bilateral Cooperative Programs
(In Millions of Francs)

Pays ou organismes concernés (1)	Expériences scientif. (2)	Télécom-munications (3)	Observ. de la terre + col.données (4)	Grands Prog. scientif. (5)	Actions exportat. (6)	Vols habités (7)	TOTAL
ETATS-UNIS (8)	22,000	-	51,200	-	-	10,000	83,200
U.R.S.S. (9)	47,850	-	-	-	-	2,700	50,550
A.S.E. (10)	7,800	-	1,100	-	-	6,400	15,300
R.F.A. (11)	-	358,400	-	-	-	3,100	361,500
SUEDE (12)	0,650	0,450	-	-	-	-	1,100
AUTRES PAYS (13)	-	-	-	-	3,200	-	3,200
A répartir (14)	-	-	-	25,600	-	-	25,600
TOTAL	78,300	358,850	52,300	25,600	3,200	22,200	540,450

Key:

1. Countries or organizations concerned.
2. Scientific experiments.
3. Telecommunications.
4. Earth Observation and collection of data.
5. Large-scale scientific projects.
6. Export programs.
7. Manned flights.
8. United States.
9. USSR.
10. ESA.
11. FRG.
12. Sweden.
13. Other countries.
14. To be allocated.

Credit Allocations to National Program
(In Millions of Francs)

(1)SCIENCE	6,400
(2)TELECOMMUNICATIONS	117,330
(3)OBSERVATION DE LA TERRE	709,700
(4)VEHICULES SPATIAUX (BALLONS)	18,200
(5)RECHERCHE & DEVELOPPEMENT	132,500
TOTAL	984,130

Key:

1. Science.
2. Telecommunications.
3. Earth observation.
4. Space vehicles (balloons).
5. Research and development.

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CSO: 3698/358

SEP OF FRANCE TO BUILD STATIONS FOR RECEIVING SPOT DATA

Paris ELECTRONIQUE ACTUALITES in French 16 Mar 84 p 12

[Article: "Towards a Diversification of SEP's Image Processing Activity"]

[Text] Over the past year, the SEP [European Propellant Company] has been consolidating its satellite image processing activities under a single self-sufficient division. The latter has at its disposal a know-how acquired during the development of the METEOSAT [European Meteorological Satellite(s)] program, and the SPOT [Earth Observation Probe System] program for which SEP supplies earth stations. In the near future, the division plans to extend its activities into applications distant, this time, from the space domain.

The SPOT system, we will recall, designed by the CNES [National Center for Space Studies] and being built by France jointly with Belgium and Sweden, comprises an earth observation satellite, the first of which is to be launched in May 1985, and data-receiving earth stations for which SEP is the prime contractor. SPOT images will provide a resolution of 20 meters in color and 10 meters in black and white. The Spot-Image Company, created 1 and 1/2 years ago, handles relations with foreign stations and the distribution of the images.

Spot-Image Company's International Agreements

Some dozen countries have expressed interest in SPOT images. These countries are, for the most part, equipped for the American Landsat system. In Japan, RESTEC [expansion unknown], an organization similar to the French GTDA [Aerospace Remote-Sensing Group], as well as the Ministry of International Trade, have expressed their interest in receiving SPOT data. In Great Britain, two agreements have been signed: One with the Ministry of Commerce and Industry, the other with the Nigel-Press Company. In the United States, where the American subsidiary of Spot-Image operates, SPOT images will be received specifically by a local station.

The SEP's image-processing division heads have estimated a requirement for 30 stations to be installed worldwide. This number could vary depending on the degree of self-dependency desired by interested nations. The SEP division will build some 10 of them, at the rate of one per year, principally in

Africa, the Middle East, South America, and possibly China. The equipment being offered by the French company will receive, equally, both Spot and Landsat D data, which puts the French builder in an advantageous position with respect to its competitors: The German MBB [Messerschmitt-Bolkow-Blohm], the American General Electric Company, and the Canadian Mac-Donnel company, all of which offer either the SPOT or the Landsat version. To date, SEP has delivered the French SPOT-Landsat SRIS [Space-Image Receiving Station] at Toulouse. The CRIS [Space-Image Rectification Center] is to be acceptance-tested this summer. A Landsat station, expandable to SPOT, has been delivered in Brazil. A SPOT-Landsat D station for Bangladesh is now in its integration stage at SEP. The reception part is in its installation phase, and delivery of the CRIS is scheduled for the end of 1984. For the Swedish station, SEP will supply the recording system and the quick-look data-display equipment, as well as a CRIS to be delivered in February 1985.

SEP Software

As prime contractor for these stations, SEP provides their integration, most of the software and hardware required for restoration of images, and the Vizir [laser image-display] system, which was developed for the Meteosat stations. At the client's request, the rectification centers are equipped with either Solar 16-bit computers supplied by CIMSA [expansion unknown] or Vax 780 32-bit computers; the Brazilian station was equipped with the latter.

The image-processing division employs some 100 persons and has an annual revenue of close to 100 MF [million francs], which is expected to grow by 20 percent in 1984.

Into the building of satellite-image receiving and preprocessing stations, this division incorporates thematic image processing systems, depending on the user's needs (agriculture, land improvement, etc), consisting of a computer equipped with appropriate peripherals and software. A line of this type of equipment is presently under development based on Solar and Vax computers.

For image restoration, the division offers a family of three products: Vizir monochrome, Vizircolor and Vizirmatic. These systems furnish high-definition images on hard copy or film, and use a magnetic-bushing drum as well as a laser beam. The Vizircolor system, the only one of its kind, instantly restores an image in color. The division offers two families of image analyzers, VIP 16 and VIPS 32, enabling interactive manipulations or corrections to be made, starting with digital or analog images from different sources, for various uses in research or production. An analyzer of color negatives has been developed for fast long-distance transmission applications. In about a year from now, the division plans to market image analyzer and restorer unit. In addition, the remote-sensing domain being a relatively narrow market sector, the division is turning toward other fields of image-processing applications, particularly those of medicine and the press.

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INNOVATION INCENTIVES, R&D STRATEGY AT ITALY'S AGUSTA

Rome AVIAZIONE in Italian Mar 84 pp 100-103

/Report by Dr Raffaello Teti: "Public Demand Policy as Activation and Dissemination Instrument in Enterprise System's Innovation Processes"/

/Excerpts/ Dr Raffaello Teti, vice president and deputy administrator of Agusta SpA /Incorporated/ (EFIM /Manufacturing Industry Holding and Financial Company/ Group), recently briefed the Industry Committee of the Chamber of Deputies on the topic indicated in the title. AVIAZIONE is publishing the complete text of the briefing given by Dr Teti below.

Innovation in the Agusta Group

The Agusta Group is a diversified complex whose reason for existence springs from its own management philosophy, that is, innovation. It is organized in the form of three divisions which, respectively, deal with the following sectors: Helicopters, aircraft, and systems; it employs more than 11,000 persons. R & D activities are carried out by about 2,000 highly qualified employees and this division's expenditures exceed 200 billion. The main guidelines pursued by the Agusta Group in the research field were aimed at acquiring ever broader technological autonomy.

In the helicopter field, the Group--which began operations in 1952 following license agreements--progressively extricated itself from this technological dependence and achieved full and autonomous design capacity, turning out complex projects, such as the A-109 and A-129 models (the latter reveals a high level of technological development and is earmarked for the Italian Army) which have already asserted themselves worldwide; it managed to become an equal partner with the British company of Westland on the EH-101 helicopter project, certainly one of the most difficult initiatives currently in progress in the international aviation industry.

The Group also achieved great results in the aircraft sector. Here, the conceptually most important fact, from the angle of the company's operational philosophy, was the switch from the production of conventionally-powered aircraft to jet aircraft. The completed projects are a result of the company's own design effort and confirmed the correctness of the decisions that were made, as clearly indicated, for example, by the S.211 aircraft whose

reliability has recently been confirmed once again in the commercial field. The Group's design capacity is developing also in the field of avionics, electronics, and simulation systems in keeping with the development of aviation engineering. The following remarks are derived from the experience accumulated by the Agusta Group in its effort to achieve functional adaptation and continuous innovation.

Research in the Company Context

The Agusta experience shows that R & D can no longer be conceived as being aimed exclusively at the technological innovation function regarding the particular product. In a more general sense it must be directed at all of the activities which are aimed at developing the company as a whole.

From this angle, we can detect the following five main lines of methodological and operational in-depth development in the Agusta setup: (a) Operations research, aimed at the identification of the product that can best perform certain roles in the environment of the market that is of interest to the Group's companies; (b) technological research, aimed at the definition of the technologies necessary to turn out the product, as identified above, on optimum bases. It is made up of a broad range of scientific-technological specialization efforts including, in particular, aerodynamics, propulsion, materials, electronics, electronoptics, flight simulation, etc.; (c) system research, for the purpose of evaluating the reliability and compatibility of all of the technological choices made. In line with the most recent developments of the entire aerospace field, this type of research assumed a central role in the logic of research and design. In a market that is ever more characterized by the demand for "systems," both in the military field (ASW helicopters, AT helicopters, etc.), and in the civilian field (health, environmental protection, "executive" /systems/, etc.), the role of the vehicle or carrier is becoming increasingly important with respect to the development of the "use" to which it will be devoted; (d) research on production processes, intended to identify the manufacturing processes that will be most suitable for turning out a particular product at the least possible cost; (e) methodology research, to identify the methods necessary for design and planning, for development, and for experimentation so as to improve the product. This research category includes all of the experiments aimed at the refining and updating of marketing and sales methodologies; of methodologies used in human resources management and advancement; of strategic planning; and of data processing.

Human Resources

As we said before, more than 2,000 researchers are at work within the Agusta Group. The experience acquired by Agusta in this field leads us to the conclusion that the human factor is decisive in the execution of the right kind of R & D policy. In this respect we can say that, qualitatively speaking, the available human resources have been perfectly able to cope with the tasks assigned to them while quantitatively there has been a personnel shortage because the company was no longer able to pay for the costs by itself.

It is practically impossible with certainty to establish the best number of R & D personnel and its possible value would to a great extent have no meaning anyway. The optimum number as a matter of fact depends on many

considerations including the following, in particular: (a) National or enterprise industrial policy decisions, depending upon whether the industry is operating mostly as a subcontractor, on a license basis, or on its own projects or in cooperation with someone else; (b) the existence, at least, of national organizations involved in applied research as it relates to aeronautics or strong scientific research organizations in general. The possible existence of such centers can, on the one hand, help to meet such industrial requirements or, on the other hand, by virtue of its stimulating action, it can directly bring about an increase in the number of company R & D personnel; (c) the international scenario, including conditions, such as the current ones, which stress international cooperation and exchange of technology and which demand a qualitative and quantitative level on the part of R & D personnel that will match the level of the potential partners; (d) market requirements, involving the employment of high-quality and large-quantity R & D resources in keeping with the level of sophistication of the demand. On the other hand, a stagnating market requires a major industrial R & D effort to make the best possible products available at competitive costs. Besides, the direct industrial offset requirements are becoming ever more pressing. This tends to increase the ratio between R & D personnel and the total personnel force.

Factors on Which R & D Quality Depends

We must note that the competitiveness of an aeronautical product cannot be understood in the restrictive sense (performances) but rather in a broad sense, featuring the complete involvement of technologies adopted to build the particular plane. The quality of R & D is thus directly proportional to the scope of the planning effort. The greater the investment has been in terms of research, the greater will be the product's qualitative content.

It is clear therefore that the quality of R & D depends heavily on many factors, among which we must list the following in particular: (a) Individual qualities of personnel derived from the following: (a1) Intellectual level; (a2) school and postgraduate education as well as industrial on-the-job training; (a3) professional motivations deriving from the awareness and the condition of enterprise objectives, confidence in the management; stimulating professional environment; (b) degree of organization of the company R & D process and clarity and definition of objectives; (c) qualitative and quantitative adequacy of available research means (data processing machines, experimental workshops, information equipment, connections with other research centers, universities, etc.).

In the Agusta Group, the above-mentioned aspects have been tackled in organizational terms through the following: Organic procedure for the selection of personnel assigned to R & D; postgraduate university-level training and professional refresher courses, given in the research management facilities, both at home and abroad (finalized CNR /National Research Council/ projects, national research plan of the MRST /Ministry of Scientific and Technological Research/, AGARD /expansion unknown/, technical associations); in-house seminars for internal company dissemination of R & D organization centers; investments in research equipment; development of models for the professional advancement of R & D personnel; creation of the research and development center at Brindisi.

Relations Between Industry and the Academic World

Among the two main lines along which research is being developed--basic research and applied research--it is evident that the first is bound to have its natural place in the research institutes of the universities whose programs should be oriented systematically at also covering the needs of industry, in addition to complying with the scientific directions of the university itself. In this field, Italy reveals some obvious shortcomings, not only because it lacks a reference frame from which the universities could derive elements of direction for their own research activities, but also because of the extreme poverty of available means. In spite of this, the experience of the Agusta Group in this field has been positive. Fruitful contacts have been carried out and are being carried out with the Italian universities both directly, through research contracts with university institutes, and indirectly, through participation in the final projects of the CNR which generally are handled by the university institutes. The pertinent contracts were financed by the Agusta Group either with in-house funds, expressly earmarked for research, or with funds deriving from development contracts with the defense administration /ministry/, or with funds deriving from IMI /Italian Credit Institute/ financing for research projects (Law 1089). Planning requirements--for which it was either impossible or inconvenient to find the appropriate competence and experience in Italy on short notice--furthermore persuaded Agusta to collaborate with foreign university institutes.

Relationship Between Government and Enterprise in Innovation

Innovation Incentive Legislation

The recognition of the need for an innovation strategy and the observation of the economic dimension of its implementation already led to the adoption of legislative instruments providing incentives for research and innovation. The instruments available as of now however--even though correctly developed from the conceptual viewpoint and from the angle of the objectives--turned out to be insufficient when it comes to putting together the real elements of "certainty" in support of initiatives of advanced-technology sectors. They did not always prove to be clear and they required continuous adaptations of efforts that had been planned; they furthermore did not constitute a reliable reference frame as regards the scope of the support that could be obtained in fact. But, above all, it turned out that they could be launched only in a rather late time frame as compared to the enterprise's real needs.

The instruments we are talking about here only too often consisted of financial aid that was received after the fact, rather than a real moving force for new and quick initiatives. This had negative effects on the Group's economic and financial management level. Resorting to ordinary borrowing, to make up for the delay in the allocation of public funds, as a result of the rise in interest rates on the market, led to ever higher financial burdens which became extremely heavy and partly undermined the public determination to provide support.

A first response to the supply of the necessary elements of financial, program, and management certainty, in support of research and innovation strategy, can come from the adoption--within the sector planning framework--

of specific instruments that would take the special aspects of the individual divisions into account when necessary. In this respect we cannot fail to note the conviction that, among them, the aviation sector itself should be made the subject of legislative action which would institute a stable program and financial reference frame that would provide clarity, certainty, and the possibility of orientation and guidance within a single legislative measure. The bill on the aviation industry, which is now being studied by the Industry Ministry, could represent a part of the solution in this respect.

Public Sector's Role

We furthermore think that the availability of financial incentives--which substantially and in procedural terms are more suitable and faster, although constituting an important aspect of public action on the delicate topic of innovation--certainly does not exhaust this function. This brings out the need for a more marked role of the government in defining the conditions and the reference frame for the activities identified and carried out by the enterprises, by the public centers, and by the academic world, disseminating the results in a timely and early fashion. Precisely because the environment in which the start of innovation processes is most decisive happens to be the enterprise world as such, precisely because of that it is evident that any initiative, approved and promoted by the public sector, should lead to an immediate impact and a broad dissemination effect above all within the industrial system itself.

Efforts to be Promoted

From this angle, the aviation sector's most immediate needs can be listed as follows: (a) Adaptation of financial incentives on the sector level so as to enable the domestic industries to operate under conditions equal to those of the competing countries; (b) develop the public demand in the strict sense of the word through the upgrading of national production and technological capacities, with the help--on the part of the government agencies--of activities aimed at the development of new technologies that are of interest to the agencies themselves and through the acquisition of the subsequent production results. As we know, the aviation industry in long-range terms is an example that is symbolic of the need for such a policy. The greater part of the most significant national aviation achievements as a matter of fact sprang from the opportunities offered by Italian defense requirements and--as, by the way, in all countries with an aviation industry--it seems unthinkable, even in long-range terms, that the nation's aviation industry could survive without a systematic stimulus from the demand of the public administration. On the other hand, considering also the high degree of competitiveness in this sector, it is very difficult to win new slices of the international market or to hold on to those already gained if the product sold does not offer the indirect guarantee of having been adopted, also due to quantitative restrictions, by the public administration of the country of origin. This is particularly important for the Agusta Group whose output is sold on international markets to the extent of more than 80 percent.

On the other hand, public or government orders proved to be essential elements during the current phase of low economic activity. It is not a coincidence that aircraft companies worldwide, which were able to absorb the negative effects of the crisis of this sector, were precisely those

that were geared toward military needs and toward which the government implemented a policy of placing orders and thus performed an anti-recession function. This not only prevented output levels from dropping below the critical point but it guaranteed that the research processes would not be interrupted and that is of vital importance. This relationship between the government and the industry, in the Agusta case, recently for example led to the completion of projects such as the A-129 AT helicopter for the army or the launching of programs such as the EH-101 helicopter, in cooperation with Westland, something that could not have been done without public financial support; products which, as far as the company is concerned, constitute basic opportunities for the acquisition of aviation and system technologies that are indispensable for its own continued position in the technological vanguard.

It was precisely these experiences which once again underscored the unresolved serious problems of contract interface between industry and government in the field of high-tech activities, in other words, problems which, by virtue of the economic dimension which they bring about, involve the risk of harming this indispensable relationship (in the cases mentioned, Agusta operated with in-house financing for many years on the basis of a simple relationship of trust with the defense establishment); (c) in terms of basic and operations research impetus and coordination, the establishment of a national research center is indispensable. The pertinent national project--the CIRA /expansion unknown/--although approved some time ago, has not yet materialized, even though it appears to be more and more indispensable not only to prevent expensive duplications of effort but also to be able to develop ideas of national interest that are difficult to carry out on the company level; (d) we are developing the use of sector plans which, although correctly identified, have not yet taken on the necessary administrative force that would enable them to constitute a ready economic reference frame for company planning. Nor are we going to overlook new forms of providing impetus for research, such as, for example, the facilitation of joint-venture cooperation agreements which will make it possible to obtain new technological capacities in vanguard sectors already developed abroad but only in their infancy in Italy; (e) on the international level, finally, Italy must acquire a definite capacity for obtaining--in view of foreign product acquisitions--compensations on an equal technological level, primarily in the sector considered.

Looking at the national planning level, the leadership role could thus enable the government to concentrate public spending on initiatives that would directly generate the dynamics of the country's progress, giving preference to sectors whose progress is considered to be of priority importance not only to preserve the technological advantage for the country in dealing with the intermediate and emerging nations, but also to keep it on the level of the countries that are most advanced in fields in which Italy has achieved such parity.

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CSO: 3698/373

SCIENTIFIC AND INDUSTRIAL POLICY

LABOR UNION SETS UP DENMARK'S LARGEST VENTURE CAPITAL FIRM

Stockholm 7 DAGAR in Swedish 27 Apr 84 p 13

[Article by Staffan Dahllof]

[Text] Trade Union funds are a new feature on the Danish capital market. The newly started corporation of the Danish Federation of Trade Unions, A/S Dansk Erhvervsinvestering [Danish Business Investment Corporation] has, in a short time, become Denmark's largest venture capital firm. About forty companies have announced their interest in participating in the 240 million Danish kroner which Dansk Erhversvinvestering has at its disposal. The share capital of the corporation will be doubled within 6 months.

The Danish Federation of Trade Unions launched its first venture capital on the market for the very purpose of creating new jobs. Aerøsø Havbrug [Aerøsø Fishing Company] will receive funds to aid it in its salmon and salmon trout breeding in the Great Belt. Applications from 21 major projects are now awaiting the decision of the venture capital firm.

"The projects in question are concerned with things such as data processing, plastic production, food processing and energy production. In principle, there is no limit to the kind of projects we may support. However, the more technology is involved and the farther advanced it is, the better. We welcome brand new enterprises which may provide new jobs, and we welcome enterprises which may provide export earnings, and, where it is feasible, we base ourselves on Danish raw materials," says Lars Beckvard, managing director of Dansk Erhvervsinvestering.

"The time has come that we ourselves share in the responsibility for providing wage-earner capital for investments," the spokesman for the Danish Federation of Trade Unions, Knud Christensen, said at the formation in the summer of 1983 of Dansk Erhversvinvestering.

Modest Venture

The argument makes one think of the debate on the Swedish wage-earner funds. However, the Danish wage-earner funds are a very modest venture. Erhvervsinvestering will, within the foreseeable future, only have at its disposal less than one fourth of the capital received by the Swedish funds each year.

The Danish Federation of Trade Unions, moreover, at an early stage, removed from its agenda the question of using its capital for increased influence.

"We shall not seek a controlling interest in the companies which we will be helping with capital. And since we do not purchase shares on the stock exchange, we shall not either come to play any key role as holders of minority posts," Lars Beckvard says.

His own background should also repress any fears of trade union control in business. Lars Beckvard came to his new post from the management of the Danish Bankers' Association.

"I had had no contact at all with the trade union movement before I was asked to take the position. Well, by the way, for a while, as a lawyer with the East Asiatic Company, I served as staff representative on the board, but that is all. The Danish Federation of Trade Unions asked for professional assistance with its capital investments. Nobody has asked me about my political affiliation," he says.

Compared to the Swedish debate on wage-earners' funds, the discussion on Dansk Erhvervsinvestering has been minimal. A few politicians belonging to the Progressive Party and the Liberal Party have been critical. They claimed that tax-free trade union funds would be favored at the cost of taxed private capital.

The Federation of Danish Industries had similar objections. However, the criticism was brushed aside from what in Swedish eyes were regarded as unexpected quarters.

Fully Accepted

Minister of Industry Ib Stetter (Conservative Party) decided to raise the limit for the share holdings of the various funds and brushed aside charges of "funds socialism:"

"From an ideological point of view, I find it appropriate for wage-earners' funds to participate, as a natural link, in the financing of production and employment. It is a question of voluntary contributions and not least of a community of interests," he said.

As a result of this, the government coalition partner, the Liberal Party, became more restrained in its criticism, and the Federation of Danish Industries also lowered its voice.

"We believe that Dansk Erhvervsinvestering will be functioning as a normal venture capital company. Statements from certain Social Democrats alarmed us at first, but with the management they have chosen and in view of the intentions they have shown so far, we have the best hopes," Jørgen Hansen of the Federation of Danish Industries tells 7 DAGAR.

"We have now become fully accepted politically," Lars Beckvard, managing director, says. "The Danish business climate is probably somewhat different from the

climate prevailing within the Swedish business sector. We have but 72 firms which are considered large according to the standards of the European Economic Community, i.e. which have upwards of 500 employees. It is, moreover, my experience that the climate is better in small enterprises than in large ones."

Although the firm has toned down its ideological profile, Lars Beckvard says that Dansk Erhvervsinvestering will be lending a willing ear to the viewpoints of the employees in the enterprises which it is interested in supporting.

"I would not recommend investments in an enterprise which does not appear to be in a good shape, as far as its environment is concerned, nor would I recommend investments in enterprises which have become known for many labor conflicts. We pay personal visits to all those who want our contributions in order to get an idea of the atmosphere. I believe that the employees may expect more from us than from other investors."

At the same time, he rejects the claim made by critics that investment decisions are made on political grounds.

"Our aim is merely to attempt to make the Danish cake bigger, the subsequent distribution of the cake will be up to others," Lars Beckvard says.

Quotation on Stock Exchange in Sight

The usual Swedish financial term for venture capital firms is high-risk firms. The risk lies in the risky distribution of the venture capital. In contrast to banks, high-risk firms are prepared to wait for 5 to 10 years for the rewards for the risks they have taken. High-risk firms are becoming an increasingly normal source of capital within fields such as information and human engineering, where the development costs are considerable during the first few years of an enterprise. High-risk firms often combine their financial aid with active participation in the management of the enterprises which they support.

Dansk Erhvervsinvestering was started by the Danish Federation of Trade Unions. However, the individual trade unions decide for themselves whether they want to purchase shares in the company. One third of the capital stock of Dansk Erhvervsinvestering stems from the funds of trade unions--though not their strike funds--one third stems from pension funds and one third from commercial and savings banks. The managing director, Lars Beckvard, says that Dansk Erhvervsinvestering will probably be introduced on the Danish Stock Exchange when the capital stock has reached half a billion Danish kroner.

Danish banks, too, have started their own venture capital firms, such as Danveture, RB-invest and Incentive Teknik. Dansk Erhvervsinvestering, which is owned by trade unions, is, however, the largest high-risk company in Denmark.

7262
CSO: 3698/397

SCIENTIFIC AND INDUSTRIAL POLICY

ROLE OF CNRS, ANVAR IN AIDING FRENCH RESEARCH

Paris AFP SCIENCES in French 29 Mar 84 pp 9-12

[Excerpts] Paris--The image of the French researcher ensconced in his or her ivory tower is now definitely a thing of the past. And at the CNRS [National Center for Scientific Studies], the 8,000 and more researchers, the engineers and technicians, are being more and more encouraged to think in terms of the commercialization of their research efforts.

The new terms and conditions of employment of researchers, the CNRS's policy of relations with industrial enterprises (more than 50 industrial leaders sitting on the different CNRS committees, the creation of GS's [Scientific Groups], of joint laboratories, of a position of associate director of research, etc...), the increase in the number of patent applications by the CNRS, the creation of a Directorate for Commercialization and Applicative Development of Research [DVAR], headed by Mr Jean-Jacques Duby, all attest concretely to the success of the largest French research organization.

During a press conference held in Paris on 27 March, Mr Duby reviewed his directorate's on-balance accomplishments. The following is an analysis, which AFP SCIENCES will discuss further in a forthcoming issue.

--The CNRS applied for 91 patents in France in 1983, as compared with 71 in 1982. The Chemistry Department made the largest contribution in this regard with more than one-third of the total filings; it was followed, in descending order, by the Departments of Physics, Basic Physics and Mathematics (+100 percent), and Physical Sciences for the Engineer (+50 percent). These figures represent only the patent applications filed in the name of the CNRS: To these must be added the applications filed by CNRS inventors in the names of industrial enterprises, as will be seen later.

--The number of patent licensing or transfer agreements rose from 38 in 1982 to 48 in 1983. The CNRS's patent proprietary policy (it files for "source" patents rather than applications or protective patents) is reflected in the exceptionally high ratio (53 percent) of licenses to patents.

--The number of commercialization proceedings rose from 176 in 1982 to 239 in 1983. This figure is a good indicator of the amount of activity being put into commercialization by the CNRS laboratories, since it includes patent application filings, the compiling of technical files, the negotiation of license agreements, and certain cooperative and developmental agreements.

--The number of CNRS researchers made available to enterprises and technical centers, however, remained stable: 37 in 1982, 36 in 1983. There is no doubt that this result was influenced by the uncertainties attendant upon the reform of the CNRS's employment policy, terms and conditions. There is every reason to believe that, with the entering into effect of the new rules and regulations in this regard, as well as certain of the new provisions particularly favoring job mobility, this growth indicator will show a rise in 1984 comparable to that of other years.

A special effort was made to sensitize the CNRS's personnel to the different aspects of commercialization, industrial proprietary rights, and technology transfers. As part of this effort, a memorandum on commercialization was addressed to all persons employed by the CNRS. Training sessions on industrial proprietary rights were also organized in different centers with the cooperation of ANVAR [National Agency for the Commercialization and Applicative Development of Research] and of the National Industrial Proprietary Rights Institute.

Cooperation between the CNRS and ANVAR in 1983 produced two notable results:

--The launching of the LABINFO data bank. This data bank. which is publicly accessible through the Questel serving center, makes available reports concerning more than 4,000 CNRS, university and other research organization laboratories. These reports include, in addition to administrative information on the laboratories, their principal areas of research, applications of the latter, and equipment specific to each laboratory. LABINFO is compiled and maintained by the Bank of Know-How and Techniques, a joint CNRS and ANVAR service.

--A total of 66 grants in aid, amounting to 26.5 million francs in all, were made by ANVAR to organizations belonging to or associated with the CNRS. These figures represent a very considerable increase with respect to 1982 (29 grants totaling 6.5 million francs).

[Table follows]:

Quantitative Results Posted by DVAR in 1983 (Activity Indicators)

Item	1983	1982	Percent
Patent applications[1]	91	71	+ 28%
Licenses	48	38	+ 26%
Commercialization proceedings	239	176	+ 36%
Industrial agreements[2]			
Number	172	109	+ 58%
Amount (MF [millions of francs])	20.3	9.6	+111%
Consultants	110	67	+ 64%
Individual researchers made available	36	37	- 3%
Commercialization grants in aid (CNRS)			
Number	38	17	+123%
Amount (MF)	3.4	1.8	+ 89%
Innovational grants in aid (ANVAR)			
Number	66	29	+127%
Amount (MF	26.5	6.6	+301%

1. Filed by CNRS (+10 percent of 1982 total).

2. Signed by CNRS (37 percent of total for period 1979-1982).

9399
CSO: 3698/358

RIESENHUBER URGES CLOSER TIES BETWEEN RESEARCH, INDUSTRY

Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 28 Apr 84 p 2

[Text] Federal Research Minister Riesenhuber expects the 13 government-financed large-scale research institutions, employing almost 20,000 persons, to make themselves more useful for industry and science. In a report by the administration to the Lower House which was submitted Friday, Riesenhuber demands closer cooperation between large-scale research institutions, on the one hand, and the universities and industry, on the other hand. This year, the Research Ministry makes about DM1.8 billion available for the large-scale research institutions; this is about one-fourth of the entire research budget. The large-scale research installations, which are engaged in basic research and application-oriented research, should pass their knowledge on to the practical sphere in a more systematic and faster way, Riesenhuber commented. More personnel of these institutes would have to be motivated to go into industry, at least temporarily. The federal government and the state governments created the prerequisites for hiring more young scientists in the large-scale research institutions. Scientists in the institutes should be able to concentrate more on research by being relieved of paper work.

Industry wants to support efforts to use the scientific potential of the large-scale research institutions in a more flexible and efficient fashion. This assurance was given on Friday by the Federal Association of German Industry. The bridge between industry and basic research would have to be facilitated by having the large-scale research installations work in a more practice-oriented manner. Unfortunately, only 70-80 employees switch from large-scale research to industry each year. The institutes should more rapidly turn toward new research tasks.

In his report, Riesenhuber established new main points for large-scale research. They are to be found in microelectronics, biotechnology, and materials and surface research. The institutes should increasingly work in environmental protection, health protection, and climate research. An early warning system should be established with the help of large-scale research institutes. With the help of this system--says Riesenhuber--dangers must be recognized earlier and must be fought in a target-oriented manner.

5058
CSO: 3698/379

ORGANIZATION, FUNDING OF R&D IN SWITZERLAND

Research Institutes, Projects

Stockholm LANDRAPPORT in Swedish Dec 83 pp 27-31

[Text] 4.2 Non-Industrial R&D

4.2.1 Organization

Due to the political structure of the country, the organizational whole of the R & D is difficult to express with simple means. With the help of Fig. 7, whose abbreviations are evident from Fig. 8, an attempt will be made to analyze the organization. In a subsequent section, a more detailed account will be given of the activity of each major organization.

Reseach policy in Switzerland is produced through interaction between a number of opinion-forming and executive levels. At the parliamentary level of the Bundersversammlung, the National Council and the Council of Cantons each have an advisory Commission for Science and Research, as well as an advisory organ, the Swiss Science Council (SWR). This council is the advisory organ for all questions dealing with scientific, educational and higher educational policy. Its members are not employed but come from business and industry and from the research/educational community; they do have a secretariat, however.

The Federal Office for Education and Science (BBW) is subordinate to the Federal Ministry for Internal Affairs (EDI) and is the executive organ on all issues dealing with scientific and educational policy. The BBW has functional cooperation with the Swiss National Foundation (SNF) and the four (in the figure shown as three) academies

--Swiss Academy for Medical Sciences (SAMW)
--Swiss Academy for Technical Sciences (SATW)
--Swiss Society for Natural Research (SNG)
--Swiss Liberal Arts Society (SGG)

The Swiss National Foundation is a foundation supporting research projects primarily at institutes of advanced education. By means of its considerable funds (147 million Swiss francs in 1982) and through the flexibility it has retained, the fund has developed into the most important individual factor in Swiss research policy. Together with the Federal Ministry of Foreign Affairs, EDA, the BBW controls international cooperation.

In parallel with the BBW and in functional cooperation with the Internal Ministry, EDI, there is the Swiss School Council, which is the supervisory authority for the two Federal Institutes of Technology:

--ETH [Federal Institute of Technology] Zurich and
--ETH Lausanne

as well as the five so-called annex institutes:

--Federal Institute for Reactor Research (EIR)
--Swiss Institute for Nuclear Research (SIN)
--Federal Institution for Forest Research Methods (EAFV)
--Federal Institution for Water Supply, Waste Water Purification and Water Protection (EAWAG)
--Federal Material Testing and Experimental Institution for Industry, Construction and Trade

The area of the Swiss School Council constitutes the largest uniformly headed research organization in the public sector. Placed under the Ministry of Finance (EVD) is an Economic Office (BFK), which functionally cooperates with the Commission for the Promotion of Scientific Research (KWF). The KWF supports application-oriented R & D projects. In particular those which are based on cooperation between institutions of higher learning or other scientific institutions and industry are given priority.

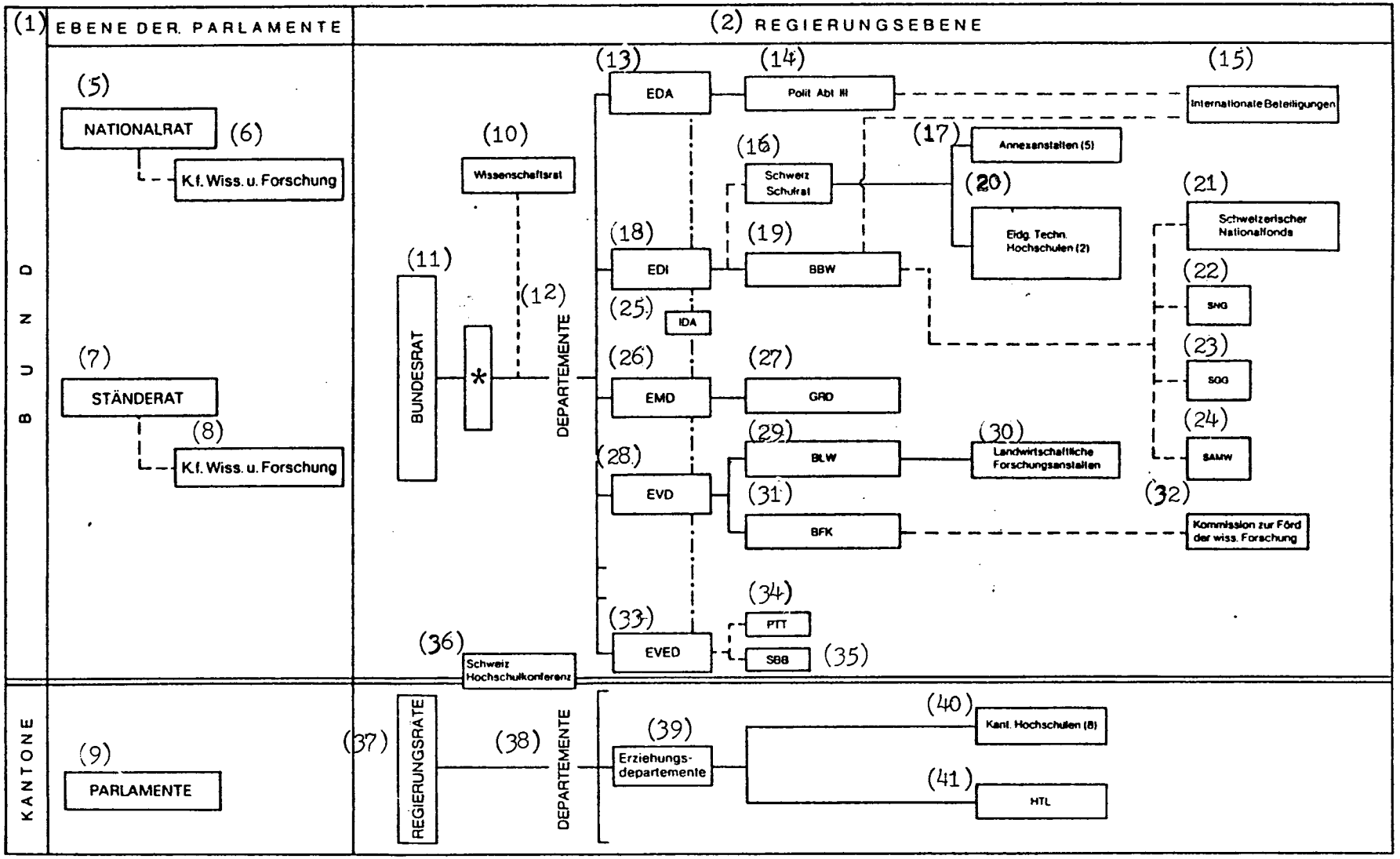
On the federal level there remains to be mentioned departmental research, which is research work principally conducted at federal research institutions. Among these are the Agricultural Testing Institutes, which through the Ministry of Agriculture, BLW, are subordinate to the Ministry of Finance, EVD. In addition there are research centers at the Ministry of Posts and Telecommunications, PTT, as well as at the railroad, SBB, and the Military Ministry, EMD.

Of the national budget of about 934 billion Swiss francs, about 18 percent are allocated to departmental research. The 18 percent are distributed roughly as follows:

military research	54 %
agricultural research	19 %
PTT, SBB	11 %
other	16 %
	100 %, that is to say about 164 billion Swiss francs

On the canton level the eight cantonal advanced schools constitute an important factor in Swiss research. Some of their costs are therefore borne by federal funds. To these advanced schools are added 22 engineering schools (ETL), which conduct R & D only to a limited extent, however, but which nevertheless play an important role, in particular for small and mid-sized companies.

Fig. 7. Research-Political Structures on the Public Authority Level (federal and cantonal)



(42) ABKÜRZUNGEN: Vgl. Anhang 2

LEGENDE: ——— hierarchische Unterstellung; – – – – funktionelle Zusammenarbeit; –·–·– Koordination; *Ausschuss des Bundesrates für Wissenschaft und Forschung

QUELLE: Zusammenstellung Schweizerischer Wissenschaftsrat

Key to Figure 7.

1. Legislature level
2. Government level
3. Federal
4. Cantons
5. National council
6. Commission for Science and Research
7. Council of Cantons
8. Commission for Science and Research
9. Legislatures
10. Science council
11. Federal
12. Ministries
13. Federal Ministry for Foreign Affairs
14. Political Department III
15. International cooperations
16. Swiss School Council
17. Annex institutions
18. Federal Department of the Interior
19. Federal Office for Education and Science of the Federal Interior Ministry
20. Federal Institutes of Technology
21. Swiss National Foundation
22. Swiss Natural Research Society
23. Swiss Liberal Arts Society
24. Swiss Academy of Medical Sciences
25. Interdepartmental Coordination Committee in the Federal Administration (sometimes also written only as Interdepartmental Coordination Committee
26. Federal Military Ministry
27. Group for Armament Services of the Federal Military Ministry
28. Federal Economics Ministry
29. Federal Office for Agriculture of the Federal Economics Ministry
30. Agricultural research institutions
31. Federal Office for Economic Questions of the Federal Economics Ministry
32. Commission for the Promotion of Scientific Research
33. Federal Traffic and Energy Economics Ministry
34. Posts, Telephone and Telegraph Enterprises (federal public undertaking)
35. Federal Swiss Railroads (federal public undertaking)
36. Swiss Higher Education Conference
37. Canton governments
38. Ministries
39. Education departments
40. Cantonal advanced schools
41. Higher Technical Institutions
42. Abbreviations: See Suppl. 2

Legend: ____ hierarchical organization; - - - functional cooperation; _.-._. coordination; * Federal Council's Committee for Science and Research

Source: Compilation by the Swiss Science Council

Table 8. Projects approved in 1981 *)
Ratio between federal contributions/company contributions

Financing	Federal contrib. (in francs)	company contrib. (in francs and in % of total costs)	volume paid for R & D (in francs)
Regular funds	6,150,158	6,470,410 (52.3 %)	12,620,568
Impulse credits	5,404,800	5,956,390 (53.5 %)	11,361,190
Total	11,554,958	12,426,800 (51.8 %)	23,981,758

*) reported for the period 1 April 1981 - 31 March 1982

Table 9. Allocations in 1981 according to research centers

Research center	regular credits	impulse credits	total Fed. contributions
ETH Zurich	1,995,558	552,500	2,548,058
ETH Lausanne	913,700	377,000	1,290,700
Basel University	-	230,000	230,000
Bern University	418,500	-	418,500
Neuenburg University	763,700	120,000	883,700
Zurich University	-	-	-
CEH Neuenburg	1,750,000	1,454,500	3,204,000
LSRH Neuenburg	-	630,500	630,500
FSRM Neuenburg	-	793,000	793,000
various research centers **)	53,700	1,177,300	1,231,000
Geneva University	255,000	70,000	325,000
Total	6,150,158	5,404,800	11,554,958

*) reported for the period 1 April 1981 - 31 March 1982
**) EMPA [Federal Material Testing and Experimental Institution for Industry, Construction and Trade (ETH annex institution), Duebendorf/St. Gallen, cantonal technical schools, Battelle Institutes etc.

In conclusion it may be said that the Federal Government, the Bund, is responsible for research at the two Federal Institutes of Technology with their five annex institutions, for departmental research and for international research cooperation. However, it is well worth noting that the institutes of technology have a great deal of autonomy, which to some extent applies to the annex institutions as well.

The cantons are primarily responsible for the cantonal advanced schools, but the Federal Government supports them, especially through the Swiss National Foundation (SNF) and through the Commission for the Promotion of Scientific Research (KWF). Support from the SNF goes mainly for basic research and to a certain extent for applied research, as well as to non-profit research institutions and schools.

Scientific Research Commission

Stockholm LANDRAPPORT in Swedish Dec 83 pp 34-37

[Text] At the federal level there is a Commission for the Promotion of Research (KWF), which supports applied industrial research. The KWF was established in 1944 and has as its duty to evaluate the scientific content of project applications from advanced schools and trade research. After approval, which is handled by the BFK, the KWF coordinates the projects with interested industrial firms, which are usually asked to provide at least 50 percent financing of their own in order for the project to be considered industrially and commercially anchored. Afterwards the KWF follows up the work during its progress, and after completed work the KWF makes a practical evaluation of the results. The subsidy must be repaid.

The support comes partly from so-called "regular funds," that is to say funds from a normal annual budget, partly from so-called "impulse credits," that is to say time-limited business activity funds. The KWF is in principle accessible to all companies, but its organization favors research in individual branches of industry and major companies where there is no risk of any competition-reducing effect.

The funds made available are very modest, the total for the two forms of support being about 11,6 million Swiss francs; industrial contributions were about 12.4 million Swiss francs, see Table 8. These funds also include additional money for trade research.

These federal funds are usually not made available directly to the companies but to various research institutions, which conduct R & D for industry, meaning advanced schools and other scientific establishments. Under certain fixed conditions, trade research institutions and companies can also be allocated funds. (See Table 9).

The major recipients are the joint research institutions of the watch industry in Neuenburg, ETH Zurich and ETH Lausanne. Broken down by branches, the watch industry heads the list here as well with 3.4 million Swiss francs, followed

Table 10a. New allocations in 1981 of funds from the Commission for the Promotion of Scientific Research, broken down according to branches of industry

Branch	Fed. contrib.	Company contrib.	Total volume paid for R & D
Microtechnology + watch industry **)	763,700	434,300	1,198,000
Metals industry	600,000	1,830,000	2,430,000
Machine-building and equipment industry	1,492,458	1,188,310	2,680,768
Textile and apparel industry	-	-	-
Foodstuff industry	160,200	126,000	286,200
Biotechnology	484,600	385,000	869,600
Forest industry	458,000	520,800	978,800
Electrical industry	1,931,200	1,906,000	3,837,200
miscellaneous	260,000	80,000	340,000
Total	6,150,158	6,470,410	12,620,568

*) Reported for the period 1 April 1981 - 31 March 1982
**) and diversification projects undertaken at LSRH, CEH and FSRM [expansions unknown]

Table 10b. Allocations for 1981 from impulse credits divided by branches *)

Branch	Fed. contrib.	Company contrib.	Total volume paid for R & D
Microtechnology and watch industry	2,601,800	2,687,040	5,288,840
Metals industry	230,000	230,000	460,000
Machine-building and equipment industry	938,500	1,116,200	2,054,700
Textile and apparel industry	154,400	155,600	310,000
Electrical industry	962,800	1,113,750	2,076,550
Biotechnology	143,800	143,800	287,600
Construction trade	288,500	425,000	713,500
Energy industry	85,000	85,000	170,000
Total	5,404,800	5,956,390	11,361,190

*) Reported for the period 1 April 1981 - 31 March 1982

by the electrical industry with 2.9 million and the machine-building and equipment industry with 2.4 million Swiss francs. (Tables 10a and 10b.)

As was briefly mentioned earlier, there are both the normal funds, "regular means," and an economically oriented program called the "impulse program." The normal program is intended to help bridge the gap between basic research and applied R & D. The money may not be used for product-oriented development.

Since 1978 there has also been the so-called impulse program for supporting technological development and education. This was a result of crucial internal deliberations concerning economic development perspectives. With this, the opportunities were expanded for being able to support technical development work as well, that is to say not merely research in which the technical engineering schools (HTL) took part. The development projects are defined so that joint financing of prototypes or development of products until they are ready for large-scale production is excluded. Furthermore, the attempt was made to facilitate access to worldwide technical and scientific documentation and close the gap regarding the acute shortage of software engineers. In the end a test institution was established for electronic components, with the task of testing and approving types. The institution belongs under the SEV.

By education is meant retraining and continuing education. Exact regulations for the application of the funds have been adopted in order to avoid distorting effects on competition. For example, projects involving several companies as partners in joint financing and trade research are favored.

In conclusion, it can be assumed that the KWF's budget will increase, since government and industry alike are expressing a great need for this form of support for business and industry.

11949
CSO: 3698/344

BRIEFS

NO GROWTH FOR FRG VENTURE CAPITAL--The growth opportunities of the risk capital market will be limited in the FRG also during the next several years. Even if the loan institutions should increasingly go in for this kind of business, the annual volume will not reach DM100 million. This was noted in Hamburg by Karl-Heinz Fanselow, business manager of WFG (German Risk Capital Company), Frankfurt. The business with risk capital could also in Germany contribute to better supply of in-house capital for medium-size industry; but this requires not only an appropriate commitment on the part of the banks but also rethinking in industry. The big enterprises should support more "spinoffs" and "buyouts" according to the Anglo-Saxon pattern. In the case of spinoffs, it is mostly a crew of experienced managers who will take over a division of their old enterprise and in the process would "take ideas along" in coordination with the old employer. They often then cooperate in the future with their former enterprises. Buyouts are enterprises of small and medium size which are bought by the managers who in the past had only managed them. [Text] [Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 11 Apr 84 p 1] 5058

CSO: 3698/379 END